DATE: July 1, 2011

TO: ALL BIDDERS

SUBJECT: SP 07-612-19
BLUE EARTH COUNTY
Letting Date: July 8, 2011

ADDENDUM NO. 1

Bidders are hereby advised that the following additions, deletions and corrections to the Plans and Proposal for the above subject shall be considered when preparing a bid:

SPECIAL PROVISIONS

Special Provision (2106) EXCAVATION AND EMBANKMENT - MODIFIED shall be revised as follows:
The following paragraph shall be inserted; "The Contractor is advised the Engineer has approximated an additional 23,400 CY of embankment material has been generated by SP 07-612-13 (CSAH 12 Stage 2 Contract), this material will be stockpiled between Station 82+00 and Station 87+00. The Contractor shall place this material into the North Abutment fill under item no. 2106.607 Common Embankment (CV)."

The 'City Embankment Material Source – Excavation Detail' (1/1) is attached hereto and made a part of the Special Provisions therefore. This detail shall provide additional guidance to the Contractor should he/she decide to excavate material from the City of Mankato Embankment Material Source.

The 'American Engineering Testing Geotechnical Report' (12/12) is attached hereto and made a part of the Special Provisions therefore. This geotechnical report includes soil borings taken at the City of Mankato Embankment Material Source Site.

The sheet titled 'ATTENTION BIDDERS (Contractor DBE Requirements to be Submitted with Bid Documents)' is hereby deleted in its entirety. The Contractor shall be responsible to meet all other DBE requirements as stated in the Special Provisions.

The 'Schedule of Prices by Category by Contract Projects' (2/2) shall be replaced with the revised Schedule of Prices dated 6/29/2011 which is attached hereto and made a part hereof. Bidders are advised to note revised quantities for Item 2106.607 Common Embankment (CV).

PLANS

Plan Sheets no. 2 & 7 shall be replaced with the Revised Plan Sheets no. 2 & 7 which are attached hereto and made a part hereof. Bidders are advised to note revised quantities for Item 2106.607 Common Embankment (CV).

NOTICE TO BIDDERS (Checklist)

The 'Notice to Bidders' checklist has been revised to reflect this Addendum. The revised 'Notice to Bidders' checklist is attached for bidders information.

Receipt of this addendum shall be acknowledged in accordance with the provision of 1210 of the Standard Specifications. In addition, each bidder shall sign and date this Memo and return a fax as acknowledgment of receiving this addendum No. 1. (FAX No. 507-304-4049).

Bidder Name_____ Date_____

Signature_____

Sincerely,

Alan Forsberg
PUBLIC WORKS DIRECTOR
Blue Earth County Highway Dept.

Blue Earth
Schedule Of Prices By Category By Contract Projects

Project Number: SP 007-612-019
Project Title or Road Number: Contract No.: 107163 - SP 007-612-019 - CSAH 12 South Highway 14 Bridge Embankment
Work Type: SP 007-612-019 - Grading and Drainage

BIDDER MUST FILL IN UNIT PRICES IN NUMERALS; MAKE EXTENSION FOR EACH ITEM AND TOTAL. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS AND SPECIFICATIONS, INCLUDING SPECIAL PROVISIONS.

Item No.	Description	Units	Quantity	Unit Price	Total Price
Project SP 007-612-019					
BASE BID					
2021.501	MOBILIZATION	LUMP SUM	1.00		
2105.602	PIEZOMETER	EACH	9.00		
2105.602	SETTLEMENT PLATES	EACH	7.00		
2105.603	WICK DRAIN	LIN FT	376,442.00		
2106.605	SUBSOILING	ACRE	4.00		
2106.607	EXCAVATION - COMMON (P)	CU YD	169,005.00		
2106.607	COMMON EMBANKMENT (CV) (P)	CU YD	260,084.00		
2106.607	EXCAVATION - SPECIAL	CU YD	4,056.00		
2106.607	SELECT GRANULAR EMBANKMENT MODIFIED 5% (CV) (P)	CU YD	28,486.00		
2451.507	GRANULAR BEDDING (CV)	CU YD	15.00		
2501.511	18" CS PIPE CULVERT	LIN FT	72.00		
2501.515	18" GS PIPE APRON	EACH	2.00		
2501.515	18" RC PIPE APRON	EACH	1.00		
2501.515	24" RC PIPE APRON	EACH	2.00		
2501.525	28" SPAN RC PIPE-ARCH APRON	EACH	2.00		
2501.525	44" SPAN RC PIPE-ARCH APRON	EACH	1.00		
2503.541	18" RC PIPE SEWER DESIGN 3006 CLASS III	LIN FT	44.00		
2503.541	24" RC PIPE SEWER DESIGN 3006 CLASS III	LIN FT	410.00		
2503.603	28" SPAN RC PIPE-ARCH SEWER DESIGN 3006 CLASS IIA	LIN FT	6.00		
2503.603	44" SPAN RC PIPE-ARCH SEWER DESIGN 3006 CLASS IIA	LIN FT	4.00		

BIDDER MUST FILL IN UNIT PRICES IN NUMERALS; MAKE EXTENSION FOR EACH ITEM AND TOTAL. FOR COMPLETE INFORMATION CONCERNING THESE ITEMS, SEE PLANS AND SPECIFICATIONS, INCLUDING SPECIAL PROVISIONS.

Item No.	Description	Units	Quantity	Unit Price	Total Price
2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48-4020	LIN FT	12.00		
2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN 84-4020	LIN FT	7.00		
2506.516	CASTING ASSEMBLY	EACH	2.00		
2511.501	RANDOM RIPRAP CLASS III	CU YD	34.00		
2563.601	TRAFFIC CONTROL	LUMP SUM	1.00		
2573.502	SILT FENCE, TYPE HEAVY DUTY	LIN FT	100.00		
2573.502	SILT FENCE, TYPE MACHINE SLICED	LIN FT	3,600.00		
2573.512	TEMPORARY DITCH CHECK TYPE 2	LIN FT	30.00		
2573.530	STORM DRAIN INLET PROTECTION	EACH	1.00		
2573.540	FILTER LOG TYPE STRAW BIOROLL	LIN FT	500.00		
2573.550	EROSION CONTROL SUPERVISOR	LUMP SUM	1.00		
2575.501	SEEDING	ACRE	33.00		
2575.502	SEED MIXTURE 150	POUND	200.00		
2575.502	SEED MIXTURE 250	POUND	1,705.00		
2575.502	SEED MIXTURE 310	POUND	269.00		
2575.511	MULCH MATERIAL TYPE 1	TON	65.00		
2575.519	DISK ANCHORING	ACRE	33.00		
2575.532	FERTILIZER TYPE 1	POUND	9,673.00		
2575.560	HYDRAULIC SOIL STABILIZER TYPE 5	POUND	10,000.00		
				Total BASE BID	
				SP 007-612-019 Project Total	
				Grand Total	

Bidder Name: _____

Bidder Address: _____

_____

Bidder Phone: _____

Bidder Signature: _____ **Date:** _____

AMERICAN ENGINEERING TESTING, INC.

CONSULTANTS
• ENVIRONMENTAL
• GEOTECHNICAL
• MATERIALS
• FORENSICS

July 1, 2011

Blue Earth County Highway Department
35 Map Drive
Mankato, MN 56001

Attn: Mr. Alan Forsberg

RE: C.S.A.H. 12 Borrow Site
Mankato, Minnesota
AET #08-10285

Dear Mr. Forsberg:

This letter report presents the results of the standard penetration test borings conducted on June 29, 2011 near Mankato, Minnesota. The work was requested by you. The scope of work related to this request includes the following:

- Two (2) standard penetration test borings to depths of 31 feet.
- Soil laboratory testing (water content).
- Preparation of this letter report, discussing the in-place soil and ground water conditions encountered and general comments on foundation support of industrial-type buildings.

We have included five (5) copies of our report.

1.0 Project Information

We understand the project site will be a embankment material source for construction of the new Blue Earth CSAH 12 interchange site near Mankato, Minnesota.

2.0 Site Exploration

2.1 Soil Borings

Logs of the test borings are attached. The logs contain information concerning soil layering, soil classification, geologic description, and moisture condition. Relative density or consistency is also noted, which is based on the standard penetration resistance (N-value).

1730 First Avenue Mankato, MN 56001
Phone 507-387-2222 • Toll Free 800-972-6364 • Fax 507-387-6999 • www.amengtest.com
Offices throughout Florida, Minnesota, South Dakota & Wisconsin

We refer you to the standard sheet entitled "Exploration/Classification Methods" for details on the drilling and the sampling methods, and the water level measurement methods. Data sheets concerning the Unified Soils Classification System, the descriptive terminology, and the symbols used on the boring logs are also attached.

The test boring locations are shown on Figure 2. The surface elevations were provided by the project surveyor.

3.0 Conditions Encountered

3.1 Soils

The area has been glaciated and most of the soil profile is clay, glacial till.

Topsoil has developed at the top of the profile, with the obvious black zone extending from two feet (2') to two and a half feet (2½') thick at the boring locations. The upper zone of till beneath the topsoil has also become weathered, resulting in some black inclusions, and lower N-values (5 to 8 bpf) than the underlying soils. Soil mottling, indicating the presence of fluctuating groundwater levels, is also noted on the boring logs within the till soils.

3.2 Groundwater

The lack of subsurface water noted at the boring locations should not be taken as an accurate representation of the actual subsurface water levels. A long period of time is generally required for groundwater to stabilize in the impermeable soils generally present at the site; this period of time is generally not available during a typical subsurface exploration program.

4.0 Geotechnical Review

The soil borings were advanced within a proposed embankment borrow area at the locations indicated by Blue Earth County personnel.

5.0 Additional Exploration and Review

We have not been authorized at this time to provide specific foundation and earthwork recommendations. As additional project details become available, please contact us for specific design recommendations.

6.0 Limitations

Within the limitations of scope, budget, and schedule, our services have been conducted according to generally accepted geotechnical engineering practices at this time and location. Other than this, no warranty, either expressed or implied, is intended.

Important information regarding risk management and proper use of this report is given in the attached sheet entitled "Geotechnical Report Limitations and Guidelines for Use".

7.0 Remarks

We appreciate being giving the opportunity to work with you on your project. If you have any questions regarding the work reported herein, please do not hesitate to contact us at (507) 387-2222 or gguyer@amengtest.com.

Sincerely,
American Engineering Testing, Inc.

Gregory A. Guyer, PE
Manager – Mankato
MN Reg. No. 44618
gguyer@amengtest.com

Report Reviewed By:
American Engineering Testing, Inc.

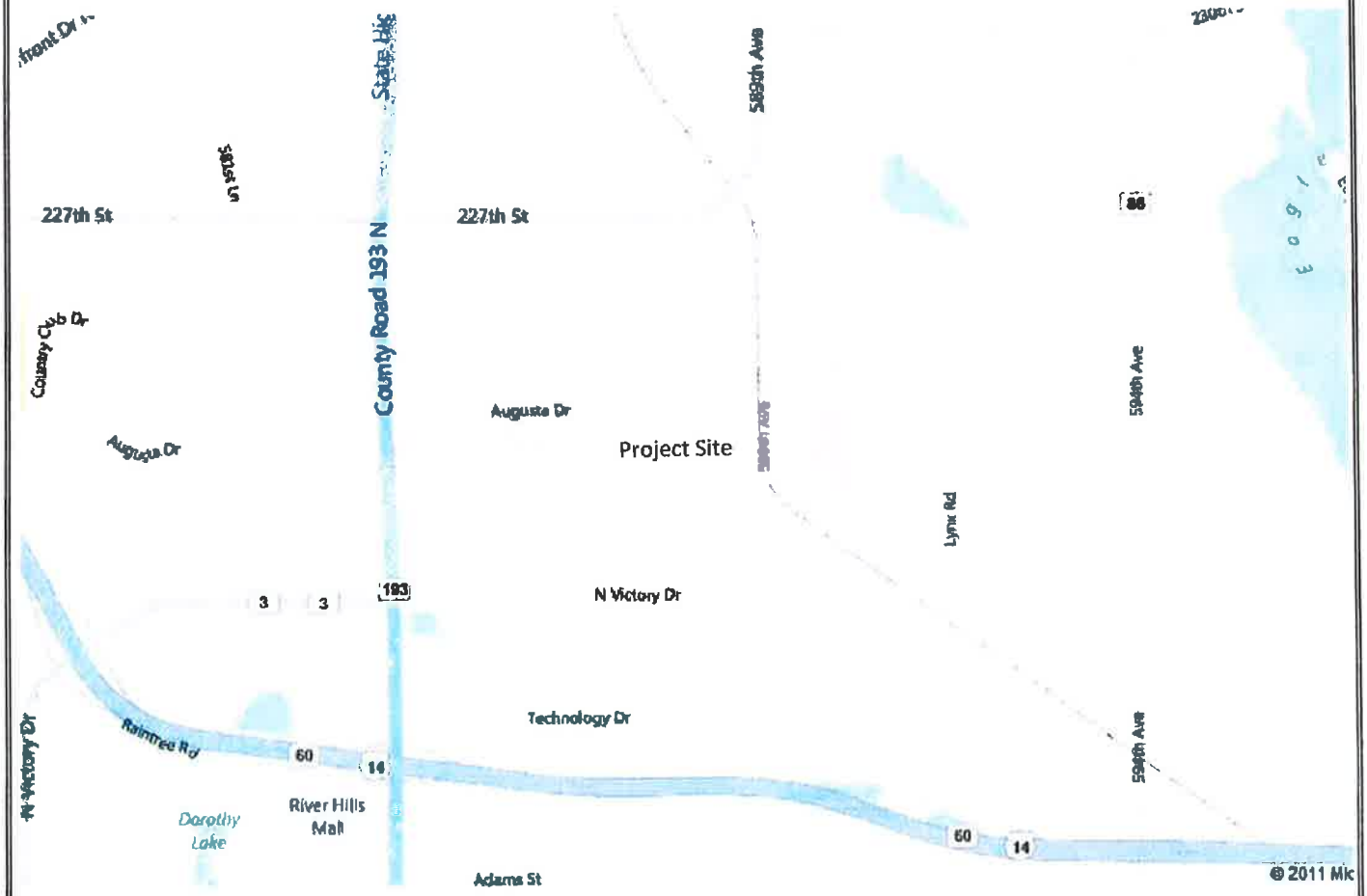
Jason Scrimshaw, EIT
Geotechnical Engineer

jscrimshaw@amengtest.com

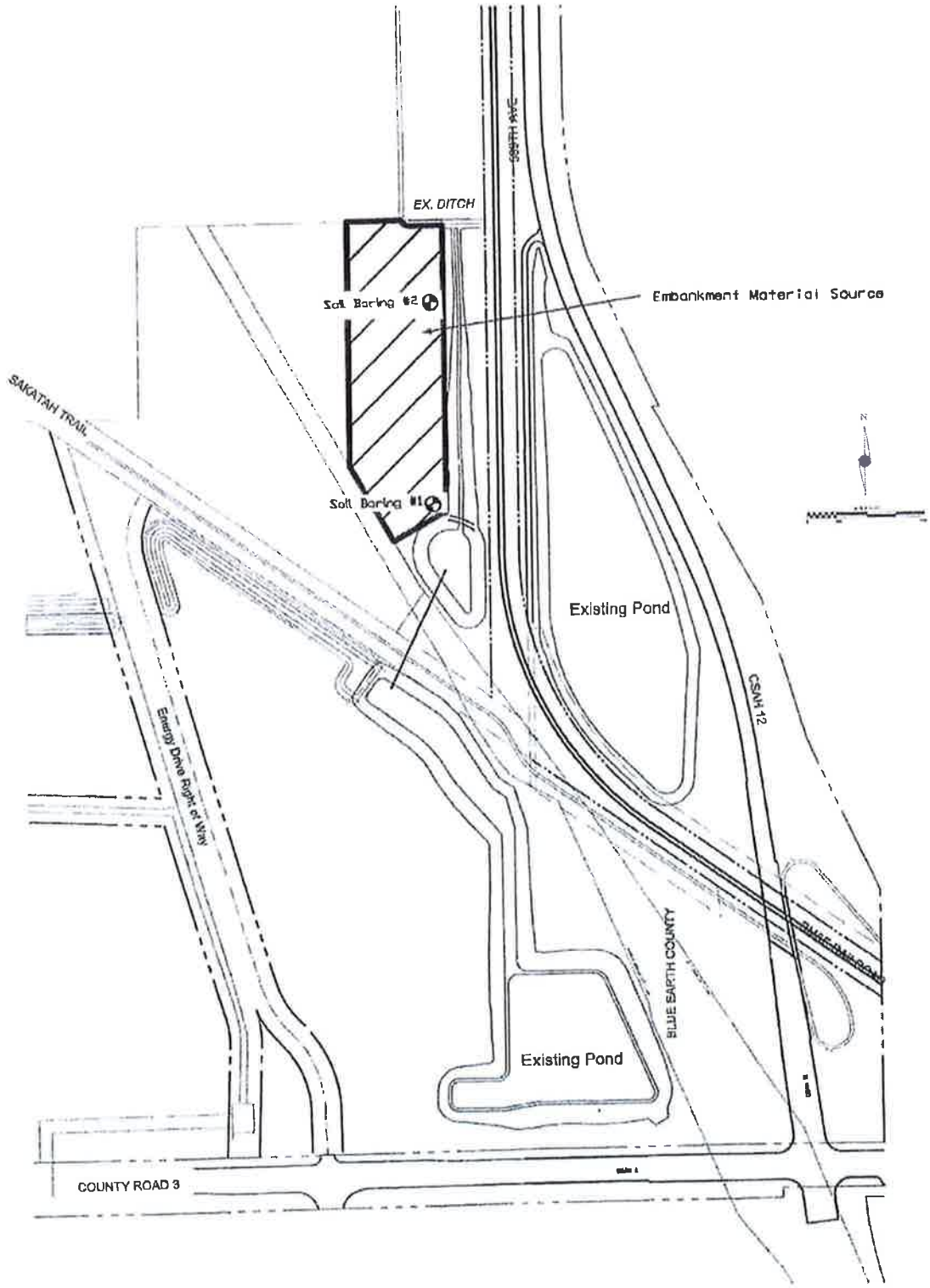
GG/JS/lmh

Attachments

- Figure 1 – Site Location
- Figure 2 – Boring Locations
- Subsurface Boring Logs
- Exploration/Classification Methods
- Boring Log Notes
- Unified Soil Classification System
- Geotechnical Report Limitations and Guidelines For Use



AMERICAN ENGINEERING TESTING, INC.	Project: Blue Earth CSAH 12 Borrow Area Mankato, MN			AET Job No. 08-10285
	Subject: Site Location			Date: July 1, 2011
	Scale: NTS	Drawn By: GG	Checked By: MS	Figure: 1



AMERICAN ENGINEERING TESTING, INC.	Project: Blue Earth CSAH 12 Borrow Area Mankato, MN			AET Job No. 08-10285
	Subject: Boring Locations			Date: July 1, 2011
	Scale: NTS	Drawn By: GG	Checked By: MS	Figure: 2

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **08-10285** LOG OF BORING NO. **B-1 (p. 1 of 1)**

PROJECT: **CSAH 12 Borrow Site; Mankato, Minnesota**

SURFACE ELEVATION: **1004.0'**

DEPTH IN FEET	MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	qp
1	ORGANIC LEAN CLAY, black (OL)	TOPSOIL		M	DS	6					
3	SANDY LEAN CLAY, brown and gray mottled, firm (CL/CH)	FINE ALLUVIUM	6	M	SS	6	34				
5	SILT, brown and gray mottled, loose (ML)		7	M	SS	12	37				
8	SANDY LEAN CLAY, a little gravel, brown, stiff to very stiff (CL)	TILL	9	M	SS	18	24				
10			12	M	SS	18	23				
13			16	M	SS	14	23				
15	SANDY LEAN CLAY, a little gravel, gray, very stiff to firm (CL)		18	M	SS	14	24				
20			8	M	SS	16	23				
25			7	M	SS	18	23				
30			8	M	SS	18	23				
31	**END OF BORING**										

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS						
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
0-29.5' 3.25" HSA	**6/29/11**	**3:30**	**31'**	**29.5'**	**31'**	**None**	**None**
BORING COMPLETED: **6/29/11**							
DR: **JN** LG: **BP** Rig: **24R**							

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP 10285.GPJ AET+CPT+WELL.GDT 6/30/11

AMERICAN ENGINEERING TESTING, INC.

SUBSURFACE BORING LOG

AET JOB NO: **08-10285** LOG OF BORING NO. **B-2 (p. 1 of 1)**

PROJECT: **CSAH 12 Borrow Site; Mankato, Minnesota**

DEPTH IN FEET	SURFACE ELEVATION: 999.1' MATERIAL DESCRIPTION	GEOLOGY	N	MC	SAMPLE TYPE	REC IN.	FIELD & LABORATORY TESTS WC	DEN	LL	PL	qp
1–2	ORGANIC LEAN CLAY, black (OL)	TOPSOIL		M	DS	6					
3–4	LEAN CLAY with sand, brown and gray mottled, very soft (CL)	FINE ALLUVIUM	2	M	SS	10	31				
5–7	SILT, brown and gray mottled, loose (ML)		5	M	SS	12	39				
8–9	SANDY LEAN CLAY, dark brown, firm (CL)	TILL	8	M	SS	14	33				
10–11			7	M	SS	16	24				
12–19	SANDY LEAN CLAY w/a little gravel, gray, firm to stiff (CL)		8	M	SS	18	21				
			9	M	SS	18	22				
20–23	SANDY LEAN CLAY, a little gravel, gray, firm to stiff (CL/SC)		6	M	SS	18	22				
25–28			9	M	SS	18	24				
30–31			6	M	SS	18	24				
31	**END OF BORING**										

DEPTH: DRILLING METHOD	WATER LEVEL MEASUREMENTS						
	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL
0-29.5' 3.25" HSA	**6/29/11**	**5:30**	**31'**	**29.5'**	**31'**	**None**	**None**
BORING COMPLETED: **6/29/11**							
DR: **JN** LG: **BP** Rig: **24R**							

NOTE: REFER TO THE ATTACHED SHEETS FOR AN EXPLANATION OF TERMINOLOGY ON THIS LOG

AET_CORP 10285.GPJ AET+CPT+WELL.GDT 6/30/11

SAMPLING METHODS

Split-Spoon Samples (SS) – Calibrated to N_{60} Values

Standard penetration (split-spoon) samples were collected in general accordance with ASTM:D1586 with one primary modification. The ASTM test method consists of driving a 2" O.D. split-barrel sampler into the in-situ soil with a 140-pound hammer dropped from a height of 30". The sampler is driven a total of 18O into the soil. After an initial set of 6", the number of hammer blows to drive the sampler the final 12O is known as the standard penetration resistance or N-value. Our method uses a modified hammer weight, which is determined by measuring the system energy using a Pile Driving Analyzer (PDA) and an instrumented rod.

In the past, standard penetration N-value tests were performed using a rope and cathead for the lift and drop system. The energy transferred to the split-spoon sampler was typically liijted to about 60% of it's potential energy due to the friction inherent in this system. This converted energy then provides what is known as an N_{60} blow count.

Most of today's drill rigs incorporate an automatic hammer lift and drop system, which has higher energy efficiency and subsequently results in lower N-values than the traditional N_{60} values. By using the PDA energy measurement equipment, we are able to determine actual energy generated by the drop hammer. With the various hammer systems available, we have found highly variable energies ranging from 55% to over 100%. Therefore, the intent of AET's hammer calibrations is to vary the hammer weight such that hammer energies lie within about 60% to 65% of the theoretical energy of a 140-pound weight falling 30". The current ASTM procedure acknowledges the wide variation in N-values, stating that N-values of 100% or more have been observed. Although we have not yet determined the statistical measurement uncertainty of our calibrated method to date, we can state that the accuracy deviations of the N-values using this method are significantly better than the standard ASTM Method.

Disturbed Samples (DS)/Spin-up Samples (SU)

Sample types described as "DS" or "SU" on the boring logs are disturbed samples, which are taken from the flights of the auger. Because the auger disturbs the samples, possible soil layering and contact depths should be considered approximate.

Sampling Limitations

Unless actually observed in a sample, contacts between soil layers are estimated based on the spacing of samples and the action of drilling tools. Cobbles, boulders, and other large objects generally cannot be recovered from test borings, and they may be present in the ground even if they are not noted on the boring logs.

CLASSIFICATION METHODS

Soil classifications shown on the boring logs are based on the Unified Soil Classification (USC) system. The USC system is described in ASTM:D2487 and D2488. Where laboratory classification tests (sieve analysis or Atterberg Limits) have been performed, accurate classifications per ASTM:D2487 are possible. Otherwise, soil classifications shown on the boring logs are visual-manual judgments. Charts are attached which provide information on the USC system, the descriptive terminology, and the symbols used on the boring logs.

The boring logs include descriptions of apparent geology. The geologic depositional origin of each soil layer is interpreted primarily by observation of the soil samples, which can be limited. Observations of the surrounding topography, vegetation, and development can sometimes aid this judgment.

WATER LEVEL MEASUREMENTS

The ground water level measurements are shown at the bottom of the boring logs. The following information appears under AWater Level Measurements@ on the logs:

- Date and Time of measurement
- Sampled Depth: lowest depth of soil sampling at the time of measurement
- Casing Depth: depth to bottom of casing or hollow-stem auger at time of measurement
- Cave-in Depth: depth at which measuring tape stops in the borehole
- Water Level: depth in the borehole where free water is encountered
- Drilling Fluid Level: same as Water Level, except that the liquid in the borehole is drilling fluid

The true location of the water table at the boring locations may be different than the water levels measured in the boreholes. This is possible because there are several factors that can affect the water level measurements in the borehole. Some of these factors include: permeability of each soil layer in profile, presence of perched water, amount of time between water level readings, presence of drilling fluid, weather conditions, and use of borehole casing.

SAMPLE STORAGE

Unless notified to do otherwise, we routinely retain representative samples of the soils recovered from the borings for a period of 30 days.

BORING LOG NOTES

DRILLING AND SAMPLING SYMBOLS

Symbol	Definition
B, H, N:	Size of flush-joint casing
CA:	Crew Assistant (initials)
CAS:	Pipe casing, number indicates nominal diameter in inches
CC:	Crew Chief (initials)
COT:	Clean-out tube
DC:	Drive casing; number indicates diameter in inches
DM:	Drilling mud or bentonite slurry
DR:	Driller (initials)
DS:	Disturbed sample from auger flights
FA:	Flight auger; number indicates outside diameter in inches
HA:	Hand auger; number indicates outside diameter
HSA:	Hollow stem auger; number indicates inside diameter in inches
LG:	Field logger (initials)
MC:	Column used to describe moisture condition of samples and for the ground water level symbols
N (BPF):	Standard penetration resistance (N-value) in foot (see notes)
NQ:	NQ wireline core barrel
PQ:	PQ wireline core barrel
RD:	Rotary drilling with fluid and roller or drag bit
REC:	In split-spoon (see notes) and thin-walled tube sampling, the recovered length (in inches) of sample. In rock coring, the length of core recovered (expressed as percent of the total core run). Zero indicates no sample recovered.
REV:	Revert drilling fluid
SS:	Standard split-spoon sampler (steel; 1d" is inside diameter; 2" outside diameter); unless indicated otherwise
SU	Spin-up sample from hollow stem auger
TW:	Thin-walled tube; number indicates inside diameter in inches
WASH:	Sample of material obtained by screening returning rotary drilling fluid or by which has collected inside the borehole after "falling" through drilling fluid
WH:	Sampler advanced by static weight of drill rod and 140-pound hammer
WR:	Sampler advanced by static weight of drill rod
94mm:	94 millimeter wireline core barrel
▼:	Water level directly measured in boring
▽:	Estimated water level based solely on sample appearance

TEST SYMBOLS

Symbol	Definition
CONS:	One-dimensional consolidation test
DEN:	Dry density, pcf
DST:	Direct shear test
E:	Pressuremeter Modulus, tsf
HYD:	Hydrometer analysis
LL:	Liquid Limit, %
LP:	Pressuremeter Limit Pressure, tsf
OC:	Organic Content, %
PERM:	Coefficient of permeability (K) test; F - Field; L - Laboratory
PL:	Plastic Limit, %
q_p:	Pocket Penetrometer strength, tsf (approximate)
q_c:	Static cone bearing pressure, tsf
q_u:	Unconfined compressive strength, psf
R:	Electrical Resistivity, ohm-cms
RQD:	Rock Quality Designation of Rock Core, in percent (aggregate length of core pieces 4" or more in length as a percent of total core run)
SA:	Sieve analysis
TRX:	Triaxial compression test
VSR:	Vane shear strength, remolded (field), psf
VSU:	Vane shear strength, undisturbed (field), psf
WC:	Water content, as percent of dry weight
%-200:	Percent of material finer than #200 sieve

STANDARD PENETRATION TEST NOTES

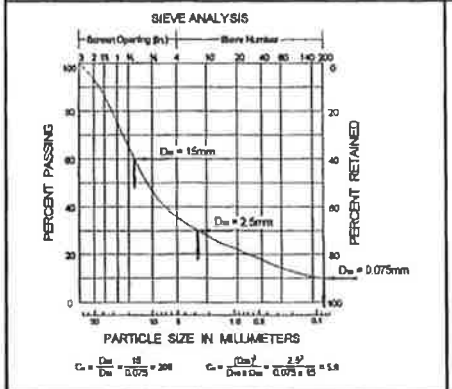
The standard penetration test consists of driving the sampler with a 140 pound hammer and counting the number of blows applied in each of three 6" increments of penetration. If the sampler is driven less than 18" (usually in highly resistant material), permitted in ASTM: D1586, the blows for each complete 6" increment and for each partial increment is on the boring log. For partial increments, the number of blows is shown to the nearest 0.1' below the slash.

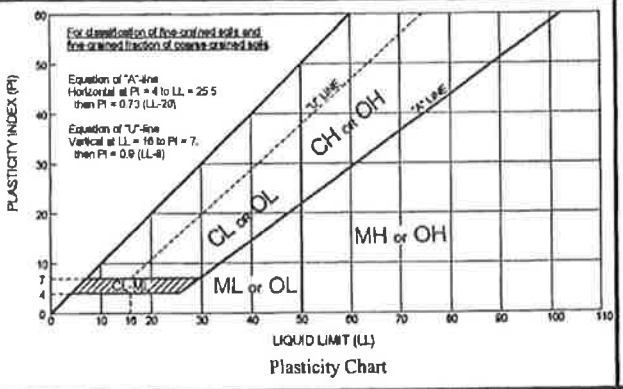
The length of sample recovered, as shown on the "REC" column, may be greater than the distance indicated in the N column. The disparity is because the N-value is recorded below the initial 6" set (unless partial penetration defined in ASTM: D1586 is encountered) whereas the length of sample recovered is for the entire sampler drive (which may even extend more than 18").

UNIFIED SOIL CLASSIFICATION SYSTEM
ASTM Designations: D 2487, D2488

AMERICAN ENGINEERING TESTING, INC.

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests[A]				Soil Classification: Group Symbol	Soil Classification: Group Name[B]
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines[C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$[E]	GW	Well graded gravel[F]
			$Cu < 4$ and/or $1 > Cc > 3$[E]	GP	Poorly graded gravel[F]
		Gravels with Fines more than 12% fines[C]	Fines classify as ML or MH	GM	Silty gravel[F,G,H]
			Fines classify as CL or CH	GC	Clayey gravel[F,G,H]
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines[D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$[E]	SW	Well-graded sand[I]
			$Cu < 6$ and/or $1 > Cc > 3$[E]	SP	Poorly-graded sand[I]
		Sands with Fines more than 12% fines[D]	Fines classify as ML or MH	SM	Silty sand[G,H,I]
			Fines classify as CL or CH	SC	Clayey sand[G,H,I]
Fine-Grained Soils 50% or more passes the No. 200 sieve (see Plasticity Chart below)	Silts and Clays Liquid limit less than 50	inorganic	PI>7 and plots on or above "A" line[J]	CL	Lean clay[K,L,M]
			PI<4 or plots below "A" line[J]	ML	Silt[K,L,M]
		organic	Liquid limit–oven dried / Liquid limit – not dried < 0.75	OL	Organic clay[K,L,M,N] / Organic silt[K,L,M,O]
	Silts and Clays Liquid limit 50 or more	inorganic	PI plots on or above "A" line	CH	Fat clay[K,L,M]
			PI plots below "A" line	MH	Elastic silt[K,L,M]
		organic	Liquid limit–oven dried / Liquid limit – not dried < 0.75	OH	Organic clay[K,L,M,P] / Organic silt[K,L,M,Q]
Highly organic soil			Primarily organic matter, dark in color, and organic in odor	PT	Peat[R]





Plasticity Chart

Notes

[A] Based on the material passing the 3-in (75-mm) sieve.

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols:
GW-GM well-graded gravel with silt
GW-GC well-graded gravel with clay
GP-GM poorly graded gravel with silt
GP-GC poorly graded gravel with clay

[D] Sands with 5 to 12% fines require dual symbols:
SW-SM well-graded sand with silt
SW-SC well-graded sand with clay
SP-SM poorly graded sand with silt
SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$, $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot is hatched area, soils is a CL-ML silty clay.

[K] If soil contains 15 to 29% plus No. 200 add "with sand" or "with gravel", whichever is predominant.

[L] If soil contains ≥30% plus No. 200, predominantly sand, add "sandy" to group name.

[M] If soil contains ≥30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI≥4 and plots on or above "A" line.

[O] PI<4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.

[R] Fiber Content description shown below.

ADDITIONAL TERMINOLOGY NOTES USED BY AET FOR SOIL IDENTIFICATION AND DESCRIPTION

Grain Size

Term	Particle Size
Boulders	Over 12"
Cobbles	3" to 12"
Gravel	#4 sieve to 3"
Sand	#200 to #4 sieve
Fines (silt & clay)	Pass #200 sieve

Gravel Percentages

Term	Percent
A Little Gravel	3% - 14%
With Gravel	15% - 29%
Gravelly	30% - 50%

Consistency of Plastic Soils

Term	N-Value, BPF
Very Soft	less than 2
Soft	2 - 4
Firm	5 - 8
Stiff	9 - 15
Very Stiff	16 - 30
Hard	Greater than 30

Relative Density of Non-Plastic Soils

Term	N-Value, BPF
Very Loose	0 - 4
Loose	5 - 10
Medium Dense	11 - 30
Dense	31 - 50
Very Dense	Greater than 50

Moisture/Frost Condition (MC Column)

D (Dry):	Absense of moisture, dusty, dry to touch.
M (Moist):	Damp, although free water not visible. Soil may still have a high water content (over "optimum").
W (Wet/ Waterbearing):	Free water visible intended to describe non-plastic soils. Waterbearing usually relates to sands and sand with silt.
F (Frozen):	Soil frozen

Layering Notes

Laminations:	Layers less than ½" thick of differing material or color.
Lenses:	Pockets or layers greater than ½" thick of differing material or color.

Peat Description

Term	Fiber Content (Visual Estimate)
Fibric Peat:	Greater than 67%
Hemic Peat:	33 – 67%
Sapric Peat:	Less than 33%

Organic Description (if no lab tests)

Soils are described as *organic*, if soil is not peat and is judged to have sufficient organic fines content to influence the Liquid Limit properties. *Slightly organic* used for borderline cases.

Root Inclusions

With roots:	Judged to have sufficient quantity of roots to influence the soil properties.
Trace roots:	Small roots present, but not judged to be in sufficient quantity to significantly affect soil properties.

B.1 REFERENCE

This appendix provides information to help you manage your risks relating to subsurface problems which are caused by construction delays, cost overruns, claims, and disputes. This information was developed and provided by ASFE[1], of which, we are a member firm.

B.2 RISK MANAGEMENT INFORMATION

B.2.1 Geotechnical Services are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared solely for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. An no one, not even you, should apply the report for any purpose or project except the one originally contemplated.

B.2.2 Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

B.2.3 A Geotechnical Engineering Report is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typically factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, always inform your geotechnical engineer of project changes, even minor ones, and request an assessment of their impact. Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.

B.2.4 Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. Do not rely on a geotechnical engineering report whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. Always contact the geotechnical engineer before applying the report todetermine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

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1 ASFE, 8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 : www.asfe.org

B.2.5 Most Geotechnical Findings Are Professional Opinions
Site exploration identified subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ, sometimes significantly, from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

B.2.6 A Report's Recommendations Are Not Final
Do not overrely on the construction recommendations included in your report. Those recommendations are not final, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual subsurface conditions revealed during construction. The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.

B.2.7 A Geotechnical Engineering Report Is Subject to Misinterpretation
Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

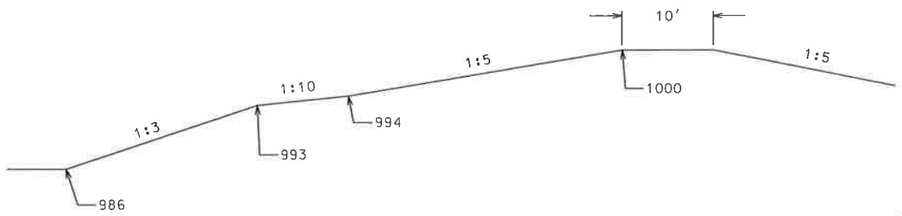
B.2.8 Do Not Redraw the Engineer's Logs
Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should never be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk.

B.2.9 Give Contractors a Complete Report and Guidance
Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, but preface it with a clearly written letter of transmittal. In the letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need to prefer. A prebid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

B.2.10 Read Responsibility Provisions Closely
Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their report. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. Read these provisions closely. Ask questions. Your geotechnical engineer should respond fully and frankly.

B.2.11 Geoenvironmental Concerns Are Not Covered
The equipment, techniques, and personnel used to perform a geoenvironmental study differ significantly from those used to perform a geotechnical study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encounteringunderground storage tanks or regulated contaminants. Unanticipated environmental problems have led to numerous project failures. If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. Do not rely on an environmental report prepared for someone else.

Pond Typical Section



NOTE: TOPSOIL COVER, EROSION CONTROL, TURF ESTABLISHMENT, SALVAGING AND REINSTALLING OF 18" RC PIPE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND INCIDENTAL TO THE EXCAVATION AT THIS SITE.

TOP OF BERM ELEVATION 1000
1,200 CU YDS REQUIRED TO BUILD 10' WIDE BERM

ESTIMATED 153,000 CU. YDS

SOUTH BORING

NORTH BORING

REINSTALL SALVAGED 18"x50' RC
INLET 995.0
OUTLET 994.8

DAKOTA, MN & EASTERN RR CO

SALVAGE INP 18"x50' RC

CSAH 12

CITY EMBANKMENT MATERIAL SOURCE - EXCAVATION DETAIL

CERTIFIED BY Alan Forsberg LIC. NO. 14720 PROFESSIONAL ENGINEER JUNE 28, 2011

SP 0702 - 116A (TH 14) CSAH 12 SP 07-612-19

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT.

STANDARD PLATES

PLATE NO.	DESCRIPTION
3000 L	REINFORCED CONCRETE PIPE
3006 G	GASKET JOINT FOR R.C. PIPE
3014 J	REINFORCED CONCRETE PIPE ARCH
3040 F	CORRUGATED METAL PIPE CULVERT
3100 G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3110 G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE-ARCH
3123 J	METAL APRON FOR C.S. PIPE
3124 B	METAL APRON CONNECTION
3221 C	CORRUGATED STEEL PIPE COUPLING BAND
3133 C	RIPRAP AT RCP OUTLETS
3145 F	CONCRETE PIPE TIES (EYE BOLT TIE)
4010 H	CONCRETE SHORT CONE & ADJUSTING RING (SECTIONAL CONCRETE)
4011 E	PRECAST CONCRETE BASE
4020 J	MANHOLE OR CATCH BASIN
4026 A	CONCRETE ENCASED CONCRETE ADJUSTING RINGS
4143 E	STOOL GRATE & CONCRETE FRAME
4180 J	MANHOLE OR CATCH BASIN STEP
8000 I	STANDARD BARRICADES

STATEMENT OF ESTIMATED QUANTITIES

PAGE	ITEM No.	ITEM	UNIT	TOTAL EST. QUANTITY	TOTAL FINAL QUANTITY
	2021.501	MOBILIZATION	LUMP SUM	1	
8	2105.602	SETTLEMENT PLATES	EACH	7	
8	2105.602	PIEZOMETER	EACH	9	
10	2105.603	WICK DRAIN	LIN. FT.	376442	
11	2106.605	SUBSOILING	ACRE	4	
7	2106.607	EXCAVATION - COMMON	CU. YD.	(P) 169005	
7	2106.607	COMMON EMBANKMENT (CV)	CU. YD.	(P) 260084	
7	2106.607	EXCAVATION - SPECIAL	CU. YD.	4056	
7	2106.607	SELECT GRANULAR EMBANKMENT MOD 5% (CV)	CU. YD.	(P) 28486	
22	2451.507	GRANULAR BEDDING (CV)	CU. YD.	15	
19	2501.511	18" CS PIPE CULVERT	LIN. FT.	72	
19	2501.515	18" GS PIPE APRON	EACH	2	
22	2501.515	18" RC PIPE APRON	EACH	1	
22	2501.515	24" RC PIPE APRON	EACH	2	
22	2501.525	28" SPAN RC PIPE - ARCH APRON	EACH	2	
22	2501.525	44" SPAN RC PIPE - ARCH APRON	EACH	1	
22	2503.541	18" RC PIPE SEWER, DESIGN 3006 CL-III	LIN. FT.	44	
22	2503.541	24" RC PIPE SEWER, DESIGN 3006 CL-III	LIN. FT.	410	
22	2503.603	28" SPAN RC PIPE-ARCH SEWER, DESIGN 3006 CL-IIA	LIN. FT.	6	
22	2503.603	44" SPAN RC PIPE-ARCH SEWER, DESIGN 3006 CL-IIA	LIN. FT.	4	
22	2506.501	CONSTRUCT DRAINAGE STRUCTURE, DESIGN 48" - 4020	LIN. FT.	12	
22	2506.501	CONSTRUCT DRAINAGE STRUCTURE, DESIGN 84" - 4020	LIN. FT.	7	
22	2506.516	CASTING ASSEMBLY	EACH	2	
23-24	2511.501	RANDOM RIPRAP CL-III	CU. YD.	34	
5	2563.601	TRAFFIC CONTROL	LUMP SUM	1	
11	2573.502	SILT FENCE, TYPE HEAVY DUTY	LIN. FT.	100	
11	2573.502	SILT FENCE, TYPE MACHINE SLICED	LIN. FT.	3600	
11	2573.512	TEMPORARY DITCH CHECK, TYPE 2	LIN. FT.	30	
11	2573.530	STORM DRAIN INLET PROTECTION	EACH	1	
11	2573.540	FILTER LOG, TYPE STRAW BIOROLL	LIN. FT.	500	
	2573.550	EROSION CONTROL SUPERVISOR	LUMP SUM	1	
11	2575.501	SEEDING	ACRE	33	
11	2575.502	SEED, MIXTURE 150	POUND	200	
11	2575.502	SEED, MIXTURE 250	POUND	1705	
11	2575.502	SEED, MIXTURE 310	POUND	269	
11	2575.511	MULCH MATERIAL TYPE 1	TON	65	
11	2575.519	DISC ANCHORING	ACRE	33	
11	2575.532	FERTILIZER TYPE 1	POUND	9673	
11	2575.560	HYDRAULIC SOIL STABILIZER TYPE 5	POUND	10000	

CERTIFIED BY Alan Forsberg LIC. NO. 14720 MAY 23, 2011
ALAN FORSBERG PROFESSIONAL ENGINEER

EARTHWORK BALANCE 1 SOUTH OF TH 14

	Exc Common C.Y.		Select Gran mod 5% C.Y.	Common Emb C.Y.
CSAH 12	987		18,221	140,547
STRIP TOPSOIL	20,803			
OVERLOAD				29,419
TURNER WEST POND	65,651			
TURNER EAST POND	39,232			
SOUTH LOOP POND	39,941			
Embankment adjusted for Select Granular				-18,221
TOTALS	166,614		18,221	151,745

EARTHWORK BALANCE 2 NORTH OF TH 14

	Exc Common C.Y.	Exc Special C.Y.	Select Gran mod 5% C.Y.	Common Emb C.Y.
CSAH 12		4,056	10,265	108,425
STRIP TOPSOIL	2,391			
OVERLOAD				10,179
Embankment adjusted for Select Granular				-10,265
TOTALS	2,391	4,056	10,265	108,339

EARTHWORK QUANTITIES SUMMARY

	BALANCE 1 C.Y.	BALANCE 2 C.Y.	TOTAL C.Y.
EXCAVATION - COMMON	166,614	2,391	169,005
COMMON EMBANKMENT	151,745	108,339	260,084
EXCAVATION - SPECIAL		4,056	4,056
SELECT GRANULAR mod 5%	18,221	10,265	28,486

CSAH 12 - SOUTH OF TH 14

		Strip Topsoil C.Y.		Common C.Y.	Select Gran mod 5% C.Y.	Overload C.Y.	Reg Fill C.Y.
CSAH 12							
	67+00						
	68+00	727		87			1,595
	69+00	1,109		154	184	1,028	4,431
	70+00	1,553		123	1,548	2,069	7,178
	71+00	1,734		100	1,726	2,213	10,048
	71+50	965		36	950	1,157	6,175
	72+00	1,035		24	1,024	1,270	7,463
	72+50	1,135		9	1,130	2,292	9,016
	73+00	1,266		4	1,263	3,392	10,620
	73+50	1,355		1	1,350	3,305	12,192
	74+00	1,347			1,356	2,514	12,158
	74+50	1,228			1,241	1,657	10,649
	75+00	1,110			1,124	1,204	9,732
	75+62	1,377			1,694	1,650	12,498
	76+10	543			575	544	5,009
SOUTH RAMPS							
	501+00						
	502+00	1,617		116	1,615	2,124	10,238
	503+00	1,442		178	1,441	2,019	7,962
	504+00	1,260		155	0	982	3,583
		20,803		987	18,221	29,419	140,547

CSAH 12 - NORTH OF TH 14

	Strip Topsoil C.Y.	Special Exc	Common C.Y.	Select Gran mod 5% C.Y.	Overload C.Y.	Reg Fill C.Y.
77+90						
78+38		302		590	530	6,818
79+00		782		1,518	1,369	18,405
79+50		637		1,211	1,104	15,247
80+00		637		1,185	1,104	14,587
80+50		636		1,150	1,104	13,876
81+00		636		1,122	1,104	12,469
81+50	426	426		1,098	1,104	10,301
82+00	1,042			1,043	1,104	8,320
82+50	923			924	1,104	6,170
83+00				424	552	2,232
	2,391	4,056		10,265	10,179	108,425

EXCAVATION QUANTITIES

CERTIFIED BY Alan Forsberg LIC. NO. 14720 6/29/2011

ALAN FORSBERG PROFESSIONAL ENGINEER